REPORT DOCUMENTATION PAGE

AD-A265 163

1. AGENCY USE ONLY (Leave blank)	2. REPORT DATE	3. REPORT TYPE AND DATES COVERED
	April 1993	professional paper

4. TITLE AND SUBTITLE
NEURAL ATTENTIONAL SENSORY PROCESSING

5. FUNDING NUMBERS
PR SU05
PE 0602234N
WU DN309207

6. AUTHOR(S)
S. Speidel

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
Naval Command, Control and Ocean Surveillance Center (NCCOSC)
RDT&E Division
San Diego, CA 92152-5001

8. PERFORMING ORGANIZATION REPORT NUMBER

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)
Office of Chief of Naval Operations
Code 01122, OCNR-20T
Arlington, VA 22217-5000

10. SPONSORING/MONITORING AGENCY REPORT NUMBER

11. SUPPLEMENTARY NOTES

12a. DISTRIBUTION/AVAILABILITY STATEMENT
Approved for public release; distribution is unlimited.

12b. DISTRIBUTION CODE

13. ABSTRACT *(Maximum 200 words)*

The goal of this work is to develop neural-like cognitive sensory processing within non-neuronal systems. In many applications, stimuli from multiple sources are simultaneously incident upon sensor arrays, creating a composite effect that requires interpretation. The problem is to effectively separate and focus upon significant partials from within the composite sensory excitations. In an effort to formulate applicable computational models, Hopfield-type dynamical system analyses have been embraced to support adaptive optimization constructs. The adaptive constructs produce responses that are based upon comparison of temporal patterns arriving on spatially separate channels. These techniques have been applied to an example sound processing application. Graphical depiction of computational results have been produced. A comprehensive memory-driven structure for adaptive sound processing is being developed. Adaptive beamforming is used as a general paradigm supporting multiple roles in sensory processing. Key elements of the architecture are discussed.

Published in *Canadian Conference on Electrical and Computer Engineering*, Vol. II, 1992, pp. MA6.8.1-MA6.8.3.

14. SUBJECT TERMS		15. NUMBER OF PAGES
signal processing neural neural networks	network beamforming	16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT
UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	SAME AS REPORT

21a NAME OF RESPONSIBLE INDIVIDUAL	[illegible]	[illegible]
S Spendel	619 553 [illegible]	Code 553

NEURAL ATTENTIONAL SENSORY PROCESSING

Steve Speidel

Naval Command Control and Ocean Surveillance Center

Abstract

The goal of this work is to develop neural-like cognitive sensory processing within non-neuronal systems. In many applications, stimuli from multiple sources are simultaneously incident upon sensor arrays, creating a composite effect that requires interpretation. The problem is to effectively separate and focus upon significant partials from within the composite sensory excitations. In an effort to formulate applicable computational models, Hopfield-type dynamical system analyses have been embraced to support adaptive optimization constructs. The adaptive constructs produce responses that are based upon comparison of temporal patterns arriving on spatially separate channels. These techniques have been applied to an example sound processing application. Graphical depiction of computational results have been produced. A comprehensive memory-driven structure for adaptive sound processing is being developed. Adaptive beamforming is used as a general paradigm supporting multiple roles in sensory processing. Key elements of the architecture are discussed.